

COMPUTER FAN ASSEMBLY MECHANISM HAVING

FILTERING AND STERILIZING FUNCTIONS

Field of the invention

The present invention relates to a computer fan assembly mechanism having
5 filtering and sterilizing functions and, more particularly, to a computer fan
assembly mechanism making use of an ultraviolet (UV) LED to illuminate a
photo-catalytic net for filtering and sterilizing air passing its intake.

Background of the invention

A conventional computer mainly uses an extractor fan located on its power
10 supply for heat radiation. The extractor fan starts to suck exterior air to the
inside of the computer via a preset through hole on the computer. The air
sucked in passes motherboard, hard disk, floppy disk, CPU, CD-ROM drive
and so on, enters the power supply, and then is discharged out by the extractor
fan. Although heat-radiating effect is accomplished, dust mites in air are also
15 sucked into the computer and stay on various kinds of electronic components
and the circuit. After accumulation for a long time, the heat-radiating effect of
the circuit will be affected, and current leakage between electrodes of the
circuit may easily arise due to humidity in air, hence letting the computer easily
crash during operation at a high speed. More particularly, because the operation
20 speed of a CPU becomes faster, the demand for heat-radiating effect is higher.
The way of only using an extractor fan on the power supply for heat radiation
cannot meet today's requirements. Accordingly, the above extractor fan of the
conventional computer has inconvenience and drawbacks in practical use. The
present invention aims to resolve the problems in the prior art.

Summary of the invention

The primary object of the present invention is to provide a computer fan assembly mechanism having filtering and sterilizing functions, which can filter and sterilize air passing its intake to prevent dusts from accumulating on the circuit board of a computer, hence enhancing the heat-radiating efficiency of the computer.

To achieve the above object, the present invention provides a computer fan assembly mechanism having filtering and sterilizing functions, which comprises a fan body. An air passageway is formed at a hollow portion in the fan body. The air passageway has an intake and an air vent, which corresponds to a fan located on the fan body. A photo-catalytic net is disposed at the intake. One or more UV LEDs are disposed on the air passageway to illuminate the photo-catalytic net. Through illumination of the UV LEDs on the photo-catalytic net, the object of filtering and sterilizing air passing the intake can be accomplished.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing, in which:

Brief description of the drawings:

Fig. 1 is an exploded perspective of a first embodiment of the present invention;

Fig. 2 is an exploded perspective view of the first embodiment of the present invention after a fan frame is added;

Fig. 3 is a perspective view of the first embodiment of the present invention

installed on a computer;

Fig. 4 is an exploded perspective view of a second embodiment of the present invention;

Fig. 5 is an exploded perspective view of a third embodiment of the present invention;

Fig. 6 is an exploded perspective view of the third embodiment of the present invention after a fan frame is added;

Fig. 7 is an exploded perspective view of a fourth embodiment of the present invention; and

Fig. 8 is an exploded perspective view of a fifth embodiment of the present invention.

Detailed description of the preferred embodiments

As shown in Figs. 1 and 2, the present invention provides a computer fan assembly mechanism having filtering and sterilizing functions. In this embodiment, a computer fan 1 mainly comprises a box-shaped fan body 10 and a fan 11 having a plurality of blades arranged thereof and pivotally disposed on the fan body 10. For convenient installation, one face thereof is designed to be a detachable cover plate 12. An air passageway 100 is formed at a hollow portion in the fan body 10. The air passageway 100 has an intake 101. The air passageway 100 can be in an R shape. A fan blade pivot 102 is disposed at the head of the R shape (i.e., the other end opposed to the intake 101). The fan 11 is a spiral centrifugal fan having a central hole. The fan blade pivot 102 can be slipped into the central hole, so that the blades of the fan 11 can rotate on the fan blade pivot 102. An air vent 120 is disposed at a position corresponding to

the fan 11. The air vent 120 is perpendicular to the air passageway, and is

located on the cover plate 12.

An ultraviolet (UV) LED 13 is disposed on the air passageway 100. The UV

LED 13 is arranged to fully illuminate a photo-catalytic net 21. The UV LED

13 can be installed at the middle section of the air passageway 100 in the first

embodiment (shown in Fig. 1) or in the distal sidewall of the R-shaped air

passageway 100 (shown in Fig. 4) in the second embodiment. Of course, the

number of the UV LED 13 can be increased according to the necessity.

For more convenient installation of the present invention on a computer, 3

10 (shown in Fig. 3), the computer fan 1 further comprises a fan frame 2 (shown in

Fig. 2). The hollow portion in the fan frame 2 matches the outer appearance of

the fan body 10, so that the fan body 10 can be disposed inside the fan frame 2.

A ventilation panel 20 is disposed at a position of the fan frame 2

corresponding to the intake 101. The photo-catalytic net 21 and a filter net 22

15 or only the photo-catalytic net 21 having filtering and sterilizing functions, is

disposed between the back face of the ventilation panel 20 and the intake 101

of the fan body 10. The UV LED 13 can thus illuminate the photo-catalytic net

21 to accomplish the object and effect of filtering and sterilizing air passing the

intake 101.

20 Additionally, Fig. 5 shows a third embodiment of the present invention, a fan

11' of a computer fan 1' is a conventional axial-flow fan. Two fixing

components 103' are projective and disposed in a fan body 10'. The fan 11' is

disposed in the fan body 10' and is locked between the two fixing components

103'. One face of the fan body 10' is designed to be a detachable cover plate

12' for convenient installation.

The fan body 10' has an intake 101' and an air vent 120'. An air passageway 100' is formed between the intake 101' and the fan 11'. The air vent 120' is perpendicular to the air passageway 100' and corresponds to the fan 11'. A positioning portion 104' is disposed on said air passageway 100' and used to install one or more UV LEDs 13'. A photo-catalytic net 21' and a filter net 22' are disposed on the intake 101', so that the UV LED 13' can fully illuminate the photo-catalytic net 21'. A ventilation panel 20' whose shape and size matching the intake 101' is disposed on the intake 101'.

Fig. 6 shows a third embodiment further comprises a fan frame 2' for convenient installation. The hollow portion in the fan frame 2' matches the outer appearance of the fan body 10', so that the fan body 10' can be disposed on the fan frame 2'. The fan frame 2' has an entry 23'. A movable cover plate 24' is disposed at a position corresponding to the entry 23'. The movable cover plate 24' can close the entry 23' to avoid intrusion of dusts after the computer fan 1' is extracted. In order to further enhance the convenience of extracting the computer fan 1', a handle 105' can be added on the fan body 10'.

Fig. 7 shows a fourth embodiment of the present invention, wherein a computer 1'' comprises a ventilation panel 20'', a filter net 22'', a photo-catalytic net 21'', a connection frame 14'', a UV LED 13'', a bow-shaped holder 15'', three parallel arranged fans 11'' defining axial-flow fans and disposed in a shell body 16''. After the filter net 22'' and the photo-catalytic net 21' are slipped into the ventilation panel 20'', they are then assembled in the connection frame 14''. The UV LED 13'' is installed on the

bow-shaped holder 15'', which is fixedly disposed at the middle one of the fans

11''. The fans 11'' are received in the shell body 16''. The connection frame

14'' is locked onto the shell body 16'' by screws (not shown). When the

connection frame 14'' is locked onto the shell body 16'', it is necessary to let

the filter net 22'', the photo-catalytic net 21' and the UV LED 13'' placed in

the connection frame 14'' face one another, so that the UV LED 13'' can fully

illuminate the photo-catalytic net 21''. Additionally, a wiring box 17'' is further

disposed in the shell body 16''. The wiring box 17'' is adjacent to the side face

of the fans 11'' located at the outer sides, and is assembled in the shell body

16'' together. Electric wires pass through the wiring box 17'' to connect the

fans 11'' and the UV LED 13''. Through parallel arrangement of the fans 11'',

the ventilation effect of the fan can be greatly enhanced to more purify the air.

Fig. 8 shows a fifth embodiment of the present invention, which has a

structure roughly the same as the fourth embodiment. The only difference is

that there are three UV LEDs 13'' parallel inserted into a printed circuit board

(PCB) 18'' and the PCB 18'' is disposed in front of the fans 11''.

The computer fan assembly mechanism having filtering and sterilizing

functions of the present invention at least has the following advantages.

1. Circulation of air can be enhanced to speed up heat-radiating speed.

2. The flow direction of air is changed. Air is sucked in from the intake

101, and is discharged out via through holes of the computer 3. During

the sucking process of air, dusts in the air is filtered by the filter net 22

to avoid accumulation dusts inside the computer's components.

3. Through the photo-catalytic net 21 and illumination of the UV LED 13,

harmful gases in air like formaldehyde, methylbenzene and methanol

can be decomposed, cell membranes of bacteria can be destructed to
further decompose organic matters in the cells and therefore kill
bacteria, and protein rings of viruses can be coagulated to deactivate
5 them and destruct the viruses. Killing rate higher than 90% for
bacteria like *Klebsiella pneumoniae*, *clostridium*, *candida albumin*,
mucedine, *staphylococcus aureus*, *colon bacillus* and hepatitis B virus.
Therefore, air can be refreshed and sterilized to enhance life quality.

Moreover, the present invention can be detached for separate use in a car or
10 a bedroom without the need of buying an air refresher, hence less occupying
the space and beautifying the environment.

Although the present invention has been described with reference to the
preferred embodiment thereof, it will be understood that the invention is not
limited to the details thereof. Various substitutions and modifications have been
15 suggested in the foregoing description, and other will occur to those of ordinary
skill in the art. Therefore, all such substitutions and modifications intend to be
embraced within the scope of the invention as defined in the appended claims.